SIOUX CITY COMMUNITY SCHOOL DISTRICT

TECHNOLOGY PLAN

Sioux City Community Schools
believe... achieve... succeed

2009 - 2014

Introduction

The District Technology Plan has been developed to provide a common frame of reference for the use of technology in the district and help build a shared vision for moving the district forward in this area. The foundation for this document is the district's overall strategic plan, its District In Need of Assistance (DINA) Plan, and other district wide planning efforts. The technology plan builds on the other strategic documents, focusing specifically on the wide range of technology related activities necessary to help fulfill the district's goals. It also serves as a key mechanism in developing technology resourcing and execution strategies in the coming years. Some of its actions or specific details will likely change but the key themes and directions towards strategic end states will not. That is not to say that this plan is rigid or static. It will be revisited annually at a minimum for a formal update and as often as necessary to stay current.

This is the first formal district-wide technology plan in the last several years. It also offers a notable departure from past plans in two important ways. Rather than being primarily descriptive in nature highlighting what the district has for technology, it will seek to establish a bold vision for moving the district forward. It will not seek to capture an exhaustive list of every single step or piece of technology in place but will put forward the vision and concepts that can drive much more detailed execution in coming years.

The second departure is that this plan is built with a different philosophy for resourcing and execution of technology across the district. To date, the district, under the concept of site based planning, has effectively allowed each building to pursue much of its technology according to its own vision. This has lead to widely divergent visions and use of technology across the district. Recently efforts were successful in consolidating technology resources in the technology department to ensure more even application. Unfortunately no common framework or vision is available to drive application and execution of these resources. This plan will serve as the initial vision for how all buildings, as a district, will move forward with the use of technology. This will help eliminate inconsistency in application and funding that has created areas of "haves" and "have nots" for technology in the district. Individual sites will still have the ability to go above and beyond the base and to innovate as they choose.

Technology in its many forms and applications has been shown to do everything from saving money through efficiencies to helping increase student engagement and achievement. Leveraged as part of a deliberate plan, it will provide the Sioux City Community School District will a powerful tool to help transform the way it educates its students.

DISTRICT MISSION

BELIEVE . . . ACHIEVE . . . SUCCEED
The Sioux City Community School District exists to educate students to ***believe*** in their talents and skills, ***achieve*** academic excellence and ***succeed*** in reaching their potential.

How Do We Do This?

The district is committed to giving students the talent and skills they need to prepare them for lifelong success. This includes teaching them the values of hard work, persistence, responsibility and respect for others.

Technology is an integral part in achieving the district's mission just like great teachers, an outstanding support staff, high quality curriculum and other components. This plan seeks to highlight how technology will assist the district in accomplishing its mission and satisfy its strategic and DINA plans in the coming years. At a high level, these plans focus on the concept of differentiated instruction, formative assessment, and data analysis used to help raise student achievement. The use of technology will help facilitate this by giving administrators, teachers and students the tools and knowledge they need to execute a 21st century differentiated curriculum. Teachers will be empowered in new ways with technology tools that help more easily adapt curriculum to a wide variety of needs and student learning styles. They will have new resources and training that they may use to help manage differentiation or construct lessons in new ways.

As cited by numerous studies formative assessment is a powerful mechanism that can also help raise student achievement. Marzano compares the gains to be expected over a 15 week period with no assessments—no gain—and 5 assessments—a 20 percentile point gain (Marzano, 2006). The contribution from formative (frequent) assessment is to enable teachers to adapt what they do to what students have learned and should learn next (Chappuis & Chappuis, 2007). The gains are not surprising; both teachers and parents have always wanted to tune instruction to particular learning needs and learning styles. And tailored, customized alternative learning pathways are critical to narrowing achievement gaps (Duffy & Kear, 2007).

Finally the district needs to be able capture and analyze data to leverage formative assessment data, aid attendance and dropout prevention efforts, and build relationships with students.

The end states and tools outlined in this plan all help drive towards implementation of differentiated instruction that is directed by more frequent standard formative assessments and strong data collection and analysis capabilities. This will be done in a manner that empowers teachers without providing extra burdens on already stretched time.

TECHNOLOGY DEPARTMENT OVERVIEW

The Sioux City Community School Technology Department supports all district technology endeavors from basic support to curriculum integration. It serves the 1,500 full time and 350 part-time staff as well as technology used by nearly 14,000 students at over 30 locations across the city. In order to carry out its assigned tasks and help the district achieve its goals, the department is divided into four primary areas that report to the technology director.

Director – (1 Full Time Equivalent (FTE)) -- The director provides overall leadership and guidance for the department. This position reports to the superintendent and is a member of the school district's cabinet.

Information Technology Operations – (7.5 FTE) -- This group is responsible for operating and maintaining all facets of infrastructure technology that the district relies upon. This includes servers, email service, network devices (switches and routers), wireless devices, as well as supporting all desktop and laptop PCs in use through the district.

Management Information Systems -- (5 FTE) – The MIS group operates the student information system including gradebook applications and provide training and support for district wide use of these systems. They produce data for required state reporting and ensure district engagement in all facets of student management.

Technology in Curriculum Integration -- (3.5 FTE) – This group is responsible for assisting teachers, administrators, and others in integrating technology components into curriculum both in a district wide manner and within individual classrooms in a manner that is value added and helps improve achievement and engagement.

Media – (10 FTE) – The media group oversees execution of all facets of media center operations from manning circulation desks to conducting classes for students.

Technology Infrastructure Technical Highlights

- The department currently operates 80 Servers running primarily Windows 2003 Server with some Linux and AIX servers. Also in use is a Storage Area Network with over 20 terabytes of storage space.
- The district maintains a fully switched Ethernet infrastructure at over 30 district locations with a minimum of 100Mbps to the desktop provided by over 400 network devices across all district sites.
- District wide area network connectivity to all buildings is provided through a 1Gbps fiber optic ring
- There are approximately 5,000 computers in the district of which 1,000 are laptops. The district is standardized on windows XP and Office 2003 on every computer.
- The district hosts nearly 2,000 email accounts on a Microsoft Exchange 2003 server with web access available for all employees who have access

TECHNOLOGY FOCUS AREAS AND STRATEGIC END STATES

In order to conceptualize moving forward in technology the department has broken down its efforts into five areas outlined below. These areas serve as a general guide to frame the wide variety of goals the technology department has defined in its effort to help the district accomplish its mission. The district will need to work in all five of these areas simultaneously to ensure it accomplishes the larger goals it is setting out to achieve and realize the vision above. Integrated execution across these areas is absolutely critical to long term success. Technology goals are driven by the strategic end state in each one of these areas as highlighted. The achievement of the strategic end states will contribute to the district's ability to differentiate instruction, conduct and use formative assessment, and leverage data collection and analysis to drive decisions.

21st Century Curriculum: Technology resources themselves merely enable or enhance the curriculum that is in place. Good technology may simply make a bad curriculum worse. However, good technology can make a good curriculum great. 21st Century curriculum is marked by richness of content as well as the ability to enable more individualized, group, and self paced instruction. This area also focuses on the development of 21st century skills that include technological skills such as keyboarding and understanding of technology concepts to being able to work in groups and other areas still under development. 21st Century curriculum will be increasingly free of time and location through the use of online content.

STRATEGIC END STATE 1: The district's curriculum is designed and implemented in a manner that leverages all available technology resources to differentiate instruction, engage students and teach 21st century skills as specified in local, state, and national standards.

21st Century Teacher Resources: This includes all necessary technology resources for a teacher to conduct their classes in an empowered 21st century environment. Technology tools in the classroom allow teachers to better differentiate instruction, engage students in more meaningful ways, add richness to instructional content, and a have a host of other impacts when tightly integrated into the curriculum. This technology includes hardware and software with items such as interactive whiteboards, collaboration applications, streaming video services, websites, and others. These resources vary by educational level and subject taught and can vary between teachers. That being said, there is a standard expectation that all classrooms will have a baseline of components to use.

STRATEGIC END STATE 2: All district teachers are trained and equipped with all necessary 21st century teaching resources required by the curriculum.

21st Century Student Resources: Students today are learning in a dynamic and rapidly changing world. The use and penetration of technology in all facets of an increasing globalized society change how individuals interact with their surroundings and learn. Additionally the basic tools students may need to succeed include different technology components. As the resources our teachers use to teach an enhanced curriculum adapt to the 21st century so must the tools that we equip our students with to learn. We have moved from an abacus to a slide rule to a calculator to a netbook. These resources include ensuring our students have the appropriate hardware or software when needed such as individual netbooks or other content access devices.

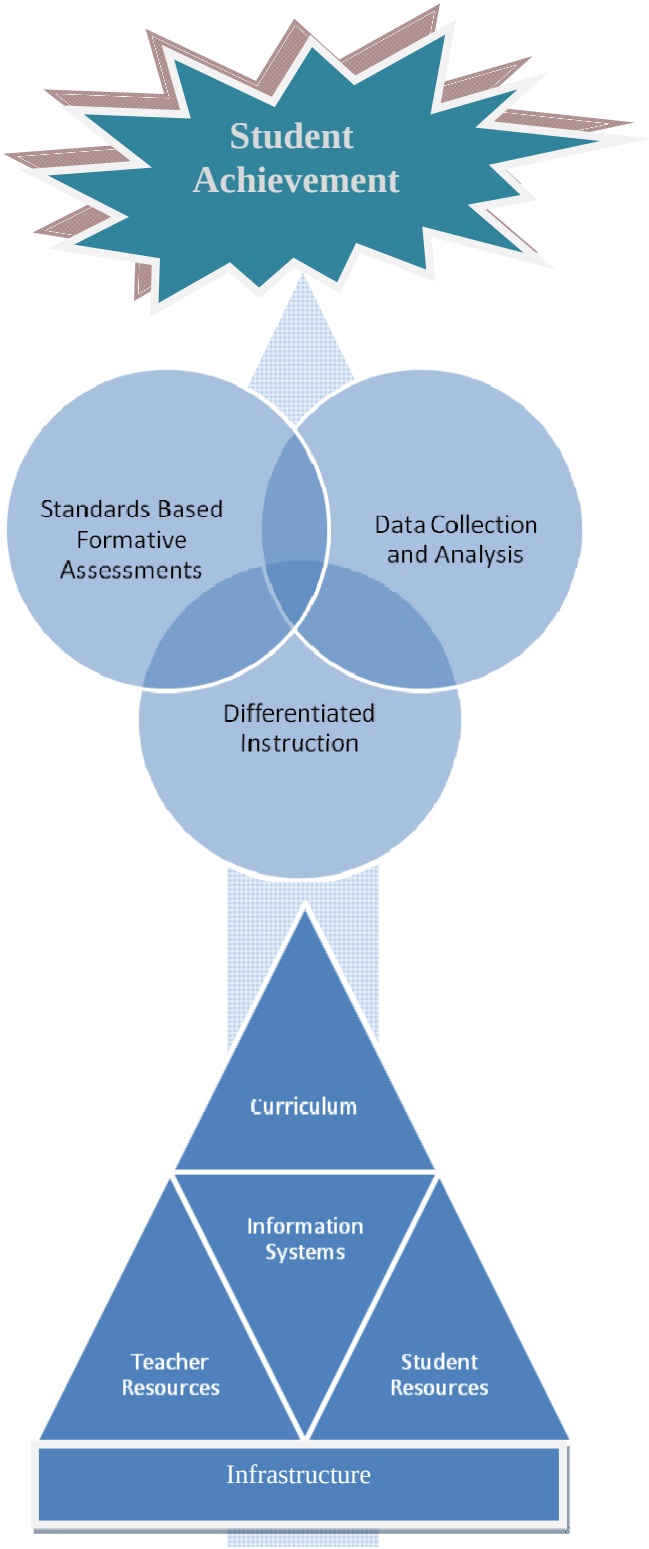
STRATEGIC END STATE 3: All district students are trained and equipped with all necessary 21st century learning resources required by the curriculum.

21st Century Information Systems: High performance organizations have found ways to leverage technology systems to gain efficiencies, empower employees, and optimize the organization's processes. This area includes information systems that automate execution of business processes such as finance, collection of student data, to scheduling courses. In a school district the most powerful use of information systems is the collection and analysis of student data through online gradebooks, assessment capabilities, and analysis systems to help drive appropriate actions and instruction. Appropriate use of these systems can minimize employee time spent doing non value added work and allow them to focus more time to performing the mission of the district.

STRATEGIC END STATE 4: The district employs cutting edge information systems such that student data collection and analysis, district operations and other functions are able to be performed with minimal effort by all appropriate personnel at a time and place of their choosing.

21st Century Information Technology Infrastructure: Having an up to date infrastructure is vital in that it underpins and enables all of the other areas to contribute to the accomplishment of the district's goals and mission. It includes building the network infrastructure both wired and wireless to allow for robust connectivity to networked resources. It also includes providing the services and servers that employees and students rely on from file sharing to email. This area also entails services such as security, content filtering, and many others. Infrastructure also entails have the right types and number of technology support personnel.

STRATEGIC END STATE 5: The district has a reliable, flexible, and capable infrastructure the supports current as well as emerging technologies and user demands in the classroom and for district operations.

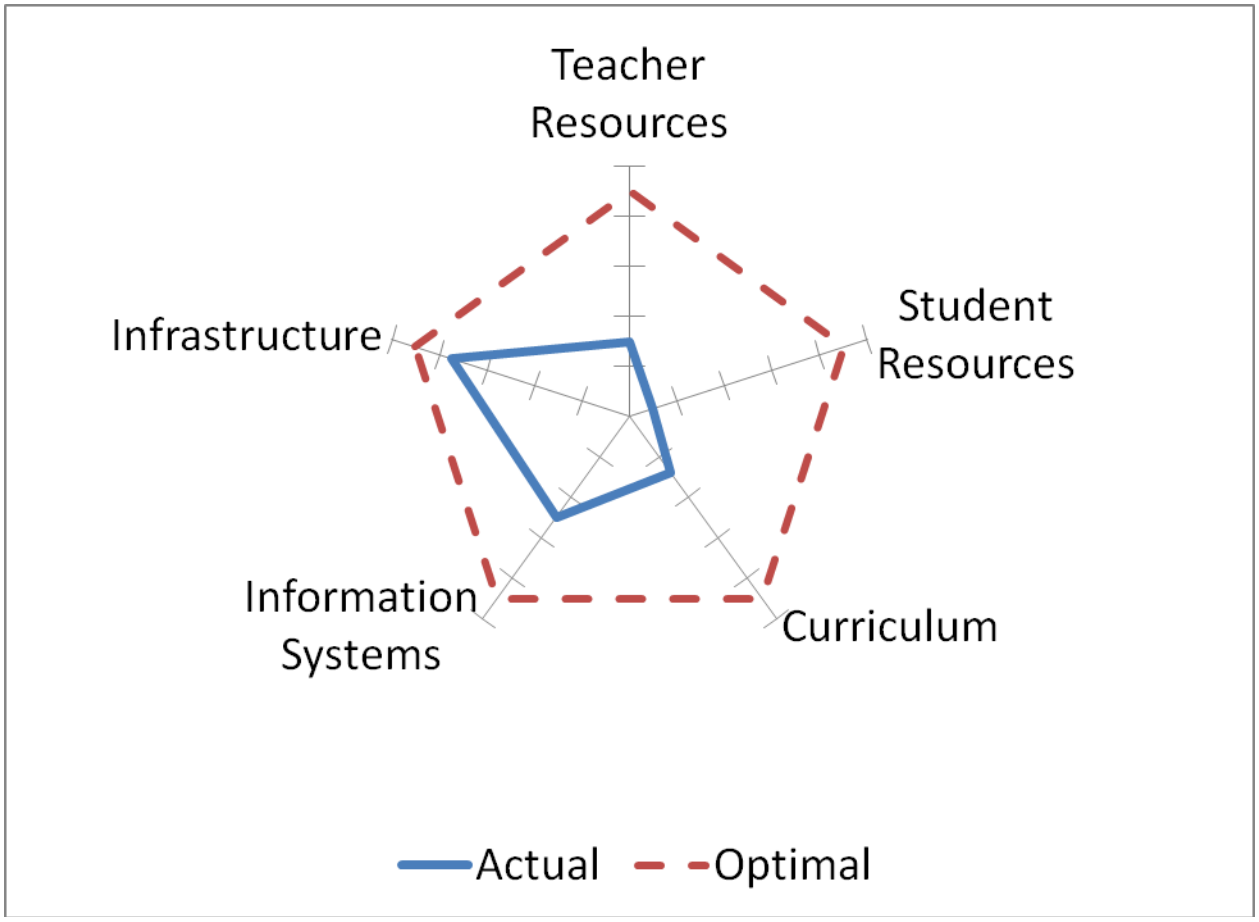


The five focus areas working in concert help the district implement differentiation, formative assessment, and effective data analysis to raise student achievement

Fiscal Year 2010-2014 Goals

This section highlights the key goals that will help drive accomplishment of the five strategic end states over the next five fiscal years. The goals offer broad vectors and targets in each area as well as highlighting some of the key actions. Timelines are offered for general planning purposes as they are understood right now they may however change over time as we refine our approaches in the coming years.

This chart below illustrates how far the district has progressed towards accomplishing each of the strategic end states. It is clear that the primary focus of the district in regards to technology has been the development of its infrastructure and information systems. A few disconnected efforts have been made with teacher resources and curriculum but very little has been done with student resources. While the scale is not scientifically rigorous, it is generally representative based on qualitative feedback to date. The dashed outer line shows the optimal balance that the goals below will seek to reach over the next five fiscal years. It is only through balanced development across the five focus areas that technology will contribute optimally in synergistic ways that are greater than the sum of the individual areas.



Comparative level of progress to date in achieving strategic end states

21st Century Curriculum

STRATEGIC END STATE 1: The district's curriculum is designed and implemented in a manner that leverages all available technology resources to differentiate instruction, engage students and teach technology skills as specified in local, state, and national standards.

Goal 1: Technology skills are taught at age appropriate level with high level of proficiency at grade level

Description: The district must ensure that required technology skills are identified and appropriately aligned with state and national standards. This will then allow for instruction at the right age to ensure students are obtaining necessary technology proficiency at the right times.

Key Actions	Timeline
Develop strategy for inclusion of technology literacy skills in elementary grades (augment into existing curriculum) including definition of standards/benchmarks	2009-2011
Begin district wide implementation of technology literacy skills in elementary	2011-2012
Update curriculum for middle school capstone technology course that aligns with local, state, and national standards	2009-2010
Develop new assessment mechanism aligned with newly developed middle school curriculum and assess 100% of middle school students by 8th grade	2009-2010
Build schedule that provides for 100% of middle school attendance in middle school technology capstone course	2010-2011

Measures of Effectiveness
All elementary students (k-5) have technology literacy curriculum exposure
100% of middle schools students take capstone technology course and 90% are proficient in 8th grade

Goal 2: All curricula incorporate 21st century student and teacher resources in a manner that enables differentiation and engages students

Description: As the district invests in giving all teachers the 21st century teaching resources they need simply relying only on teacher ingenuity will not allow for maximum return on this investment across the district. These resources must be formally included into curriculum maps and other areas ensuring teachers clearly understand when they may be able to make use of technology in their lessons.

Key Actions	Timeline
Leverage curriculum mapping efforts to include technology resources into content material across district	2010-2014
Participate closely in all new curriculum implementation efforts	Ongoing

Measures of Effectiveness

All curriculum content K-12 has formal links to technology resources as appropriate

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Goal 3: Expand online delivery including at least a few components within traditional classes, to be able to host online class during a catastrophe such as a pandemic, to fully online courses in core subjects for work ahead, credit recovery, and regular class

Description: One of the exciting developments of education and technology is the ability to offer rich classes online that decouple time and location from the learning environment. This is not a substitute for traditional classes but offers a way to reach and engage students who a more and more comfortable with an online environment.

Key Actions	Timeline
Select courses to work with and develop pilot program for online application	2010-2012
Select and standardize on one online course delivery system	2010-2011
Develop minimum requirements for basic online execution during pandemic	2011-2012
Conduct professional development for online course component development	2012
Develop and replicate best of breed practices and courses	2012-2014

Measures of Effectiveness
All courses have at least one online component

Goal 4: Online courses are available for new content areas not previously available to SCCSD students

Description: While adding online components to existing classes can offer flexibility to students and teachers a breakthrough step for the district would be to leverage the online environment to offer courses that were previously unavailable in the district. This could include subject areas not offered or course levels that are beyond the district's current ability to sustain.

Key Actions	Timeline
Develop strategy for priority areas that the district does not currently serve	2012-2013
Implement online course that is currently not available	2013-2014

Measures of Effectiveness
At least one course offered online that is not offered via other means within the district

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Goal 5: SCCSD will offer technology rich course selection offerings with a defined track for secondary development

Description: In the secondary environment technology is an end in itself with courses such as A+ and others. To date the district has not developed and sustained a rich sequential course offering that allows students to build technology skills in areas such as programming, networking or other areas. These courses could be developed in house or offered in conjunction with other local education entities.

Key Actions	Timeline
Develop and refine concept for sequence of courses (game design, networking, etc.) that may be offered independently or in conjunction with local institutions	2012-2014
Offer first course for credit in the sequence	2014

Measures of Effectiveness
Sequence of technology courses defined and offered to students

21st Century Teacher Resources

STRATEGIC END STATE 2: All district teachers are trained and equipped with all necessary 21st century teaching resources required by the curriculum.

Goal 1: All SCCSD instructional staff appropriately trained and proficient in use of available technology resources

Description: Instructional staff must clearly understand what tools they have available and how to use them in the classroom with the district's curricula. This must be closely linked with differentiation understanding and discussion.

Key Actions	Timeline
Develop technology training model for district, leveraging in place assets and concept of technology "bootcamps" to train teachers	2009-2014
Develop and conduct administrator training sessions to train building leadership	2009-2014
Host first annual technology conference in conjunction with AEA for district employees to demonstrate cutting edge practices and latest in classroom use of technology	Oct 2010
Build on-line repository of curriculum materials, screencasts, best practices, and support for educators…Allow users to populate with their own material and share feedback	2009-2013
Develop new hire training process / certification for teaching in SCCSD 21st Century classroom	2012-2013
Maintain Technology Coaches to support integration of technology into curriculum	2009-2014+
Integrate technology and 21st century resources into Professional development schedule and ongoing events	Ongoing
Form Teacher Technology Advisory Group to obtain quarterly feedback	2010

Measures of Effectiveness
Annual teacher technology survey demonstrates increasing level of self reported technology proficiency on a variety of subject areas
All teachers pass basic technology in classroom use certification after a year using district resources
Administrator survey demonstrates increasing level of self reported technology proficiency on a variety of subject areas

Goal 2: All classrooms equipped with grade appropriate 21st Century teaching resources

Description: In order to ensure teachers and administrators can apply best practices using 21st century resources they must be available across the district. The district will provide a standard baseline of 21st century teaching resources to every room to ensure equitable access throughout.

Key Actions	Timeline
Source and allow access to appropriate content that teachers require to integrate into	Ongoing

instruction (examples include youtube, SAFARI, ed videos, etc.)	
Pilot 21st century teaching resource packages at all levels according to baseline equipment (See chart below). Measure outcomes compared to non-model classrooms (see appendix B).	2009-2010
Expand effort to all K-5 classrooms across the district	2010-2011
Expand effort to 6-8 classrooms across the district	2011-2012
Expand effort to 9-12 classrooms across the district	2012-2013

Measures of Effectiveness
Pilot effort demonstrates some improvements in measured areas
All classrooms have appropriately technology packages fielded according to timeline

Goal 3: All teachers have dedicated laptop computer

Description: While fixed PCs or desktops have provided adequate access for teachers in the past, this is becoming less acceptable. Teachers require greater mobility and flexibility both in their classrooms and outside of the classroom. Having a laptop ensures teachers are able to be flexible in how they use technology.

Key Actions	Timeline
50% of all teachers have dedicated laptop computer	2010
75% of all teachers have dedicated laptop computer	2011
100% of all teachers have dedicated laptop computer	2012

Measures of Effectiveness
All teachers in district have a dedicated laptop computer for their use

Goal 4: District has enough group PC access capacity to allow teachers and district effectively host entire classes where all students have an individual computer for classroom instruction, assessments, or other purposes when required

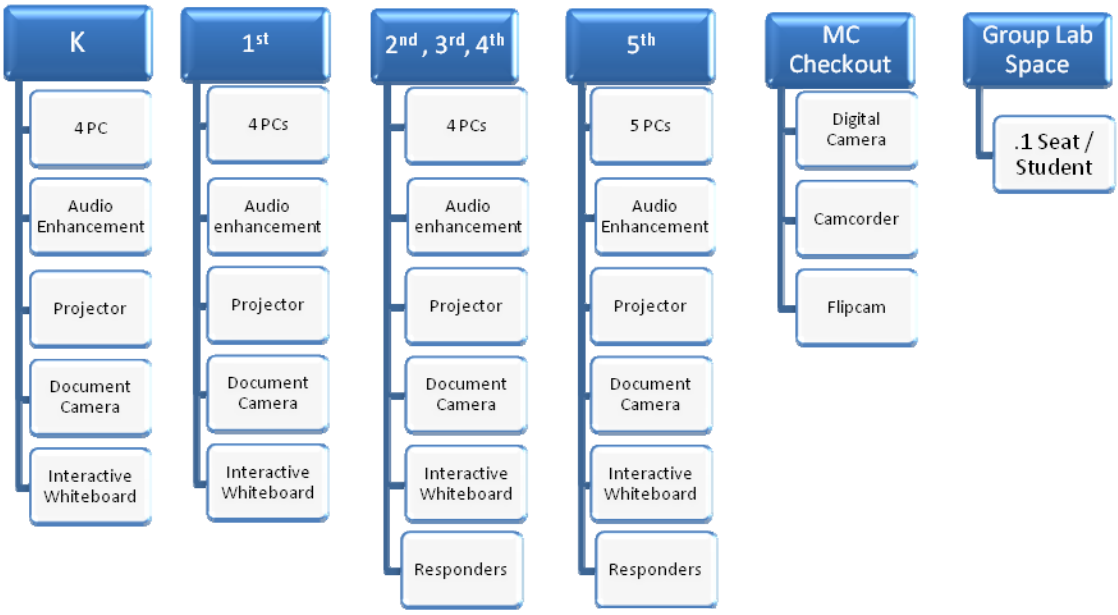
Description: While Goal 2 in this section mentions outfitting all classrooms with appropriate technology including several computers in each room, there is a need to ensure teachers have access to a class wide pc access capability. Having an entire class group of students access PCs is valuable for certain types of instruction and necessary to effectively conduct online assessments without disrupting overall schedules of buildings.

Key Actions	Timeline
District has standardized concept leveraging fixed and mobile labs to provide access and plan to resource	2010
District has enough group pc access capacity for 50% of schools	2010
District has enough group pc access capacity for 75% of schools	2011
District has enough group pc access capacity for 100% of schools	2012

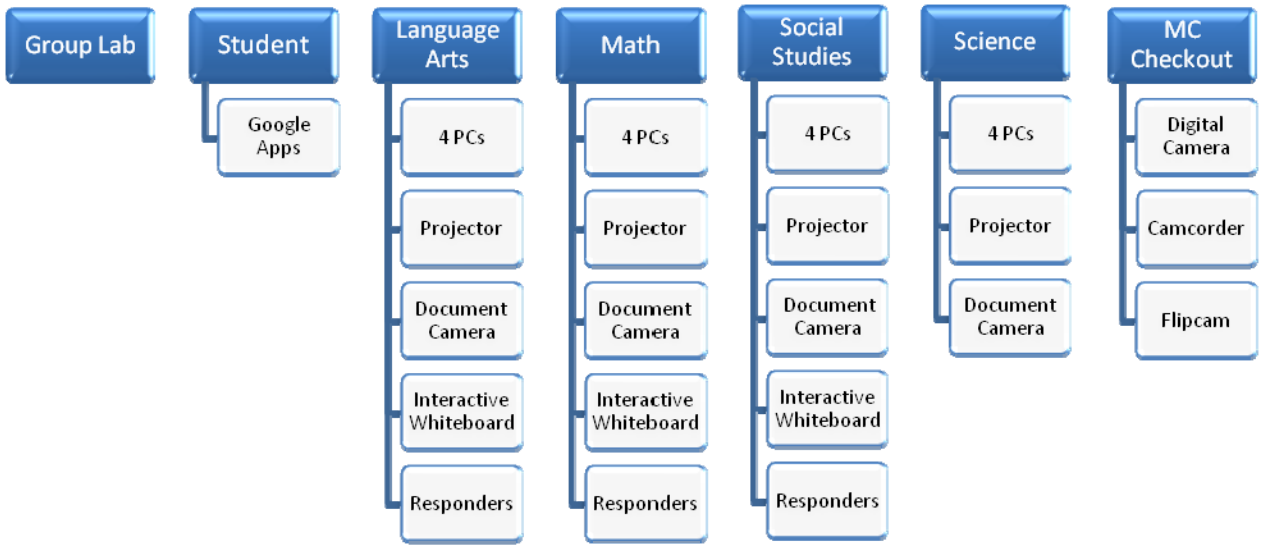
Measures of Effectiveness
All teachers able to conduct group instruction without long wait times or infrequent access
District able to conduct online assessment in expeditious manner with all students

Projected Teacher and Student Resources by Grade Level

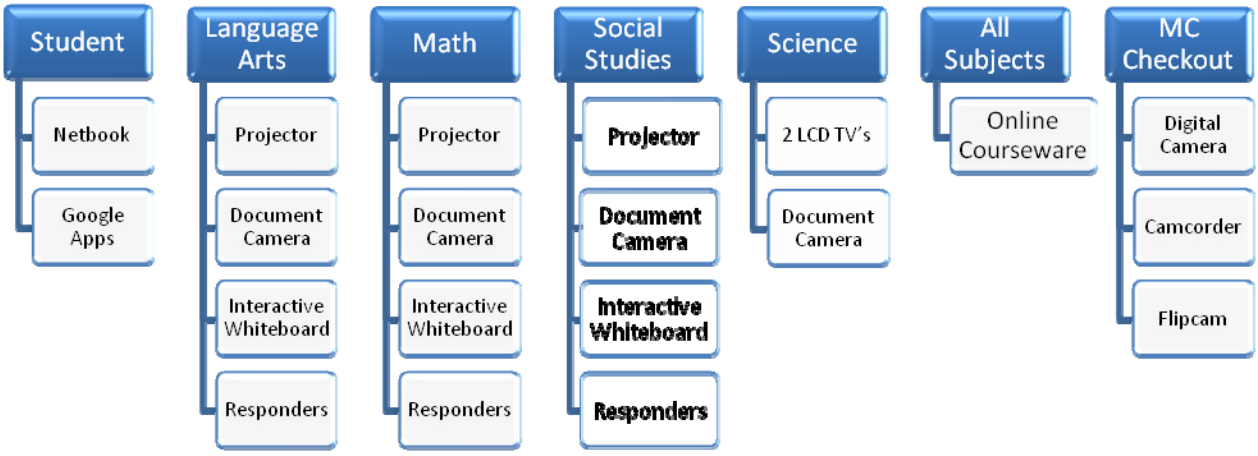
The following charts highlight currently developed baseline of equipment for each classroom listed by grade. These lists serve as a minimum expectation for available teaching resources. These lists may be modified slightly over time. Many of these tools provide research supported benefits (see Research section). All tools when taken together provide the teacher a set of instructional devices that will allow the teacher to more effectively manage the classroom, engage students better, and more flexibly reorient or differentiate instruction with less effort. At this time middle school and high school classrooms focus on core curriculum areas. Future developments will include other areas such as electives.



ELEMENTARY CLASSROOM RESOURCES



MIDDLE SCHOOL CLASSROOM RESOURCES



HIGH SCHOOL CLASSROOM RESOURCES

EQUIPMENT DESCRIPTION

Classroom PCs - These pcs are typically located within the classroom and provide the ability to allow individuals or small groups to access the computer to engage curriculum resources, online learning activities, research, or other purposes.

Projector - A projector is provided (typically mounted to wall or ceiling) that allows for projecting from a desktop or laptop computer. This allows teachers to show PowerPoint presentations, internet sites, online, local, or student produced videos, pictures, and a wide array of other educational content.

Document Camera – A document camera is effectively an advanced very high resolution overhead projector that connects to a computer and allows a teacher to capture still images or show a variety of course material from written pages to scientific experiments.

Interactive Whiteboard – Interactive whiteboards advance the traditional whiteboard by allowing interactivity with computer based programs and the projector. Students can write on boards while interacting with websites, content modules, or instructor designed items.

Responders – Student responders resemble a small remote control with an alpha numeric keypad on them. Responders are given to every student and allow teachers to give a quiz or test and see student's answers in real time. Teachers can give both formative assessments to help direct work and graded summative assessments.

Netbook – These are small fully functional laptop computers. They provide students with a content access device capable of working in conjunction with teacher lesson plans and online course management software. Additionally students have the ability to work on material anytime and in any location.

Google Apps – Google Apps, while a specific vendor solution, is representative of a broad set of software features that include email, online collaboration capabilities, calendars, website development, and other functionality. This package provides students necessary capabilities to collaborate and interact with fellow students and teachers online in the completion of assignments or other items.

Online Courseware – This is an online course management system that allows teachers to build courses and offer necessary materials through the internet. The system is similar to many seen in online college course offerings today and provides location independent access 24x7 to any course content the teacher makes available.

21st Century Student Resources

STRATEGIC END STATE 3: All district students are trained and equipped with all necessary 21st century learning resources required by the curriculum.

Goal 1: All students have necessary 21st century learning aids/tools to ensure adequate engagement, use, and participation in a differentiated 21st century curriculum.

Description: As our instructional capabilities expand and teachers are able to leverage classroom and general technology to better differentiate and manage their classrooms it will become important to ensure that students have the tools they need to engage in this new environment.

Key Actions	Timeline
Pilot netbooks and collaboration applications (Google apps) with one section of 9th grade students in one HS	2009-2010
Expand pilot to one section per HS; monitor original section in 10th grade	2010-2011
Expand pilot to two sections per HS; follow prior years	2011-2012
Rollout email and collaboration applications for high school students	2011-2012
Rollout email and collaboration applications for all middle school students	2012-2013
Expand netbook/content access device to all high school students	2012-2013
Explore elimination of physical texts in high schools	2013-2014

Measures of Effectiveness
Pilot sections show improvements in measures (grades, standardized test scores, discipline, attendance, others) as compared to non pilot groups in each year

Goal 2: All students have opportunity to have access to network resources outside of normal school hours.

Description: Network access has become the price of entrance into the globalized world driving new forms of collaboration and providing rich information resources. Students who do not have the opportunity to seek access at home will fall further behind those who do. The district will not likely be in a position to directly provide access but can work with local providers on innovative ways to bring affordable access to anyone who wants it.

Key Actions	Timeline
District work with local internet providers to develop possible options for low cost basic high speed internet access	2012-2013

Measures of Effectiveness
All student who desire to do so can obtain affordable internet connectivity
An increasing percentage of students have access year over year

21st Century Information Systems

STRATEGIC END STATE 4: The district employs cutting edge information systems such that data collection, analysis, district operations and other functions are able to be performed with minimal effort by all appropriate personnel at a time and place of their choosing.

Goal 1: District able to assess performance formatively and summatively (aligned with standards and benchmarks) in near real time without creating extra burdens for teachers or building administrators

Description: As the district continues to work on better standardization of assessment across the district it needs a system that can help do so in an efficient manner. The system should cleanly integrate with gradebook and analysis capabilities in the district.

Key Actions	Timeline
Field assessment program capable of incorporating assessments aligned to district standards and benchmarks as well as integration with district student response systems to automatically score and report results especially for formative testing	2009-2010
Populate test banks through internal efforts of by purchasing vetted questions	2010-2011
Conduct professional development	2010-2012

Measures of Effectiveness
A majority of desired assessment are offered online across the district
Student responders integrate with assessments and teachers able to use effectively

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Goal 2: Every person who needs data (performance, other) has instant access to it and the ability to perform meaningful analytics with minimal time required to do so

Description: It is currently very difficult to automatically or easily conduct analysis on any data within the district. Often times the data needed is not transparent or able to be linked with other key data such as assessment scores with student demographics. Often times this must be done "off line" requiring great amounts of time.

Key Actions	Timeline
Field analytic program capable executing complex queries, providing relational insights, profiles, alerting, and other advanced functionality	2009-2010

Conduct professional development	2010-2012

Measures of Effectiveness
All district users (teachers, administrators, staff) can execute data queries to obtain information on their class or building depending of authority level

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Goal 3: Field "next generation" user friendly student information system that seamlessly integrates with district assessment and analysis capabilities

Description: A new student information system will be a revolutionary step forward in how the district manages student data and maintains relationships with students.

Key Actions	Timeline
Field new student system	2009-2010
Conduct professional development	2010-2012
Develop procedures for populating virtual portfolio of student information to ensure rich content is capture in a way that allows teachers to more easily build relationships with students in less time	2010-2014

Measures of Effectiveness
Student system feedback is positive and meets all user expectations.
Teachers can easily see entire history of rich information on each student in their classes

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Goal 4: Field "next generation" information system that meets all district needs in finance and human resources

Description: Current finance and human resource systems serve the district well but are not built with latest enhancements. HR and finance systems should be seamlessly integrated in a manner that minimizes duplicate entry while providing robust self service options for district employees.

Key Actions	Timeline
Develop requirements / selection criteria	Spring 2011
Evaluate Possible Solutions	Fall 2011
Final decision on preferred vendor (Budget costs for FY2012)	Winter 2011
Purchase	Spring 2012
District Wide Training	Spring 2012
Implementation Complete	August 2012

Measures of Effectiveness
Overall decrease in duplicate data entry and use of paper based forms
Decreased time in finance and HR on non value added repetitive inputs

21st Century Technology Infrastructure

STRATEGIC END STATE 5: The district has a reliable, flexible, and capable infrastructure the supports current as well as emerging technologies and user demands in the classroom and for district operations.

All of the preceding efforts rely on having robust technology infrastructure components. It is imperative that we build a 21st century foundation for 21st century classrooms and 21st century teachers and students.

The goals for the district's infrastructure are driven by broad trends in technology and society that in turn demand certain features. These trends include:

- Capacity … increased demand for bandwidth
- Ubiquity/Mobility … need for access anytime/anywhere
- Proactivity … eliminating issues before they become problems
- Efficiency … maximize resources in dollars and personnel
- Security … more use increases need to protect systems/data
- Reliability … infrastructure must be fault tolerant and disaster proof

Goal 1: Network backbone capacity meets full spectrum of educational demands and is able to scale easily for all future applications

Description: Current computer applications from the gradebook system to the internet are demanding ever greater bandwidth in the district. Without a high capacity network backbone all other initiatives will be difficult to accomplish.

Key Actions	Timeline
Coordinate with FIBERCOMM installation of 1Gbps fiber links to district facilities	Nov 2009
Upgrade High Schools to 10Gbps bandwidth	Aug 2012
Explore upgrading district Internet backbone connectivity based on use	Ongoing
Explore upgrading other sites to higher bandwidth based on use	Aug 2013
Upgrade High Schools to 20Gbps bandwidth	Aug 2015

Measures of Effectiveness
No site ever has more than 75% sustained use of existing bandwidth capacity

Goal 2: District employees and personnel supporting district operations able to easily access network resources from anywhere on district property

Description: The district must ensure that its employees can have mobile access wherever they are in the district. This must be done with minimal effort on the users part.

Actions	Timeline
Expand wireless networks at high schools to provide edge to edge coverage with ".n" wireless technology for high throughput and reliability	Summer 2010
Develop procedures for high schools to provide guest access user name and passwords so non district employees can access network	2010
Update scripts, policies, and profiles so that district employees do not have to set up PCs whenever they switch computers	Summer 2010
Expand wireless networks at middle schools to provide edge to edge coverage with ".n" wireless technology for high throughput and reliability	Summer 2011
Develop procedures for middle schools to provide guest access user name and passwords so non district employees can access network	2011
Expand wireless networks at elementary schools to provide edge to edge coverage with ".n" wireless technology for high throughput and reliability	Summer 2012
Develop procedures for elementary schools to provide guest access user name and passwords so non district employees can access network	2012

Measures of Effectiveness
Any district user or guest can connect anywhere in the district wirelessly at reasonable speeds

Goal 3: Technology department proactively manages technology enterprise to prevent desktop and network device issues before they cause losses in productivity

Description: As technology becomes a greater and greater part of instruction, downtime or service interruptions for any duration will be unacceptable. The district must have the tools and procedures in place to stop or prevent issues before they turn into larger problems.

Actions	Timeline
Technology department able to proactively monitor all key network devices or nodes with alerting and other functionality. Will know what impacts of a given outage are and all personnel or affected personnel will be notified when appropriate. All devices updated with latest software.	Fall 2009
Technology department able to proactively monitor all server services with alerting and other functionality. Will know what impacts of a given outage are and all personnel or affected personnel will be notified when appropriate. All devices patched.	Fall 2009
Technology department able to easily obtain 100% software and hardware inventory and push need updates with feedback on success and failure.	Fall 2009
Robust scanning and enforcement policies instituted to prevent security related outages	2009-2010

Measures of Effectiveness
Event alerts go to right persons and are used to respond to issues before becoming larger problems

Goal 4: Increase technology efficiencies (execution and budgetary) in all areas of operation

Description: One of the great uses of technology is to help increase efficiencies in daily operations. The district will face difficult budgets over the coming years and finding efficiencies through technology is an easy and relatively painless way to help control costs.

Actions	Timeline
Institute power management across district to greatest extent possible without negatively impacting instruction or daily use	2009-2010
Consolidate servers physically and through virtualization where possible	2009-2011
Develop strategy to control printer enterprise either through managed print solution or other mechanism	2010-2011
Streamline district telephony architecture by leveraging unified communications services though technology such as voice over internet protocol. Also include IP based faxing.	2009-2014

Measures of Effectiveness
District power saving strategy in place without impacting instruction…Save $100K a year minimum
Total cost of printing in district declines
Total number of servers in place stays at or below current levels
District has unified phones system that decreases expenses for telephone lines and moves

Goal 5: District technology infrastructure able to withstand catastrophes (power loss, HVAC failure, data loss) retaining all necessary data and is able to easily recover from small scale to catastrophic losses

Description: No organization is immune from the risk of service interruption through catastrophic events. Proper infrastructure and risk management best practices will help the district mitigate this risk as much as possible.

Actions	Timeline
Migrate district data center to high availability co-location space with redundant power, cooling, and other features	2009
Implement centrally managed storage environment for all critical district data and leverage automation to greatest extent possible	2009-2010
Implement centralized management of network device configs/images	2009-2010
Develop and use e-mail archiving solution	2009-2011
Full disaster recovery plan and equipment capabilities fielded	2010-2011

Measures of Effectiveness
District downtime due to power outages or other interruption in near zero
Critical functions are able to operate with loss of primary systems and data

Goal 6: District is staffed appropriately to support administrator, teacher, and student technology needs

Description: To support the wide range of goals and initiatives relating to technology within the district, proper technology manpower levels are critical. Outside standard IT roles the district must ensure that technology coaches are maintained to support teachers in the classroom with all the technology they will be implementing in the coming years.

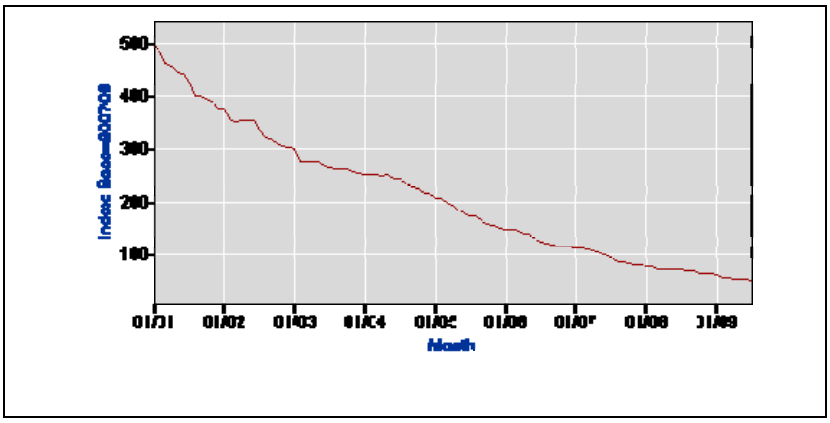
Actions	Timeline
Hire two technology coaches to support implementation of technology plan	2009-2014+
Assess staffing demands and make recommendations to Superintendent and school board when required	Ongoing
Develop concept to expand use of media personnel to provide more technology support both general and use in curriculum	2009-2011
Explore creation of Building Tech Support Lead to aid in all facets of technology support	2010-2011
Develop student internship concept to aid in supporting technology efforts	2011-2012
Users able to support themselves via automated password reset or other mechanisms	2011-2012

Measures of Effectiveness
District employees and students are able to receive any technology related support they need in a timely manner

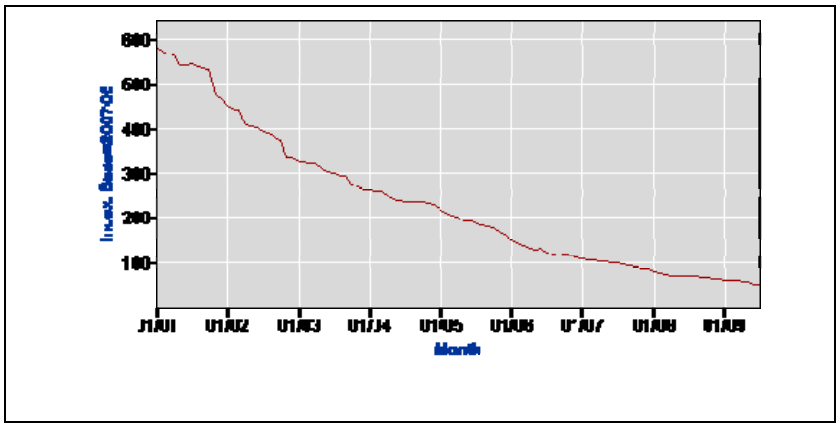
RESOURCING

Resourcing all the above goals to drive us towards the five strategic endstates will be no small undertaking. The district is fortunate that over the 2010-2014 time period technology funding will be strongly augmented through Microsoft Settlement funds as well as Federal Stimulus Funds and expanded grant opportunities. These funding streams will help ensure progress and completion of these goals even in the face of extraordinarily tight budgets. That being said in the coming years the district will still have to wrestle with the possibility of increased technology budgets to sustain district wide rollouts of technology equipment in classrooms.

There will certainly be cost efficiencies in computers and other equipment allowing the district to buy the same amount of technology for less. Technology costs decrease over time while capability constantly improves as evidenced by the graphs below.



Desktop PC Relative Price 2001-2008 (BLS Data)



Notebook PC Relative Price 2001-2008 (BLS Data)

This document will help drive resourcing strategies in coming years and as mentioned previously it will be constantly revisited to ensure appropriate budgets are developed and implemented.

RESEARCH

This plan is not an exhaustive research paper or conclusive compendium of all available sources. That being said there are some items of research that are of note for this plan.

A study by Mass Insight (2009) on high performing urban school highlights many areas that drive strong student achievement of note related to technology initiatives is:

#5 Personalization of Instruction through:

- *Formative assessments conduct with high degree of frequency*
- *Analysis and feedback is immediate (hours to days)*
- *Instruction is adapted quickly to address gaps/problems through individualization; small groups other differentiation practices*
- *Teachers have flexibility and time to address the issues (help minimize not value added tasks like grading)*

The information systems, teacher resources and student resources highlighted in this package will provide the infrastructure to frequently (and easily) conduct formative assessments through the use of responders that are linked to a capable data analysis system. The technology resources in the district will provide the teacher the ability quickly adapt leveraging their know how to better differentiate.

A large nationwide study by the Marzano Group (2009) on similar classroom technology packages for teachers including interactive whiteboards and responders found that rooms equipped with the packages realized a 17 percentage point gain in standardized test measures when compared to those without the technology packages. The most effective results were seen in the circumstances listed here

17 percent point gain in standardized test measures.

- *Teachers have 10+ years teaching experience*
- *Teacher has used the technology for 2+ years*
- *Teacher uses technology 75% of time in classroom*
- *Teacher has high confidence in their ability to use technology*

Audio enhancement technology has been widely studied over the last couple decades starting with the special education community and moving to mainstream whole classroom application. Rooms that consistently used audio enhancement for all students saw results highlighted in a selection of studies below:

McCarty and Ure (2003) Urban at risk kids in Utah 4th/5th:

- *10-15 percent higher Stanford Achievement Test scores and state's criterion referenced reading, math, and science.*

Chelius (2004) first, third, fourth, and fifth in Oregon:

- *First grade students amplified classrooms scored an average of 35 percent higher on the Dynamic Indicators of Early Literacy Skills (DIBELS) and an average of 21 percent higher on the Developmental Reading Assessment (DRA) than students in the unamplified classroom.*
- *Third grade students in amplified classrooms scored an average of 21 percent higher on Oregon's Technology Enhanced Student Achievement test and increased by an average of 32 percent in words per minute in reading fluency.*
- *Fourth and fifth grade students' words per minute averaged 35 percent higher than students in unamplified classrooms on a reading fluency test.*

Allen & Patton (1990) Iowa:

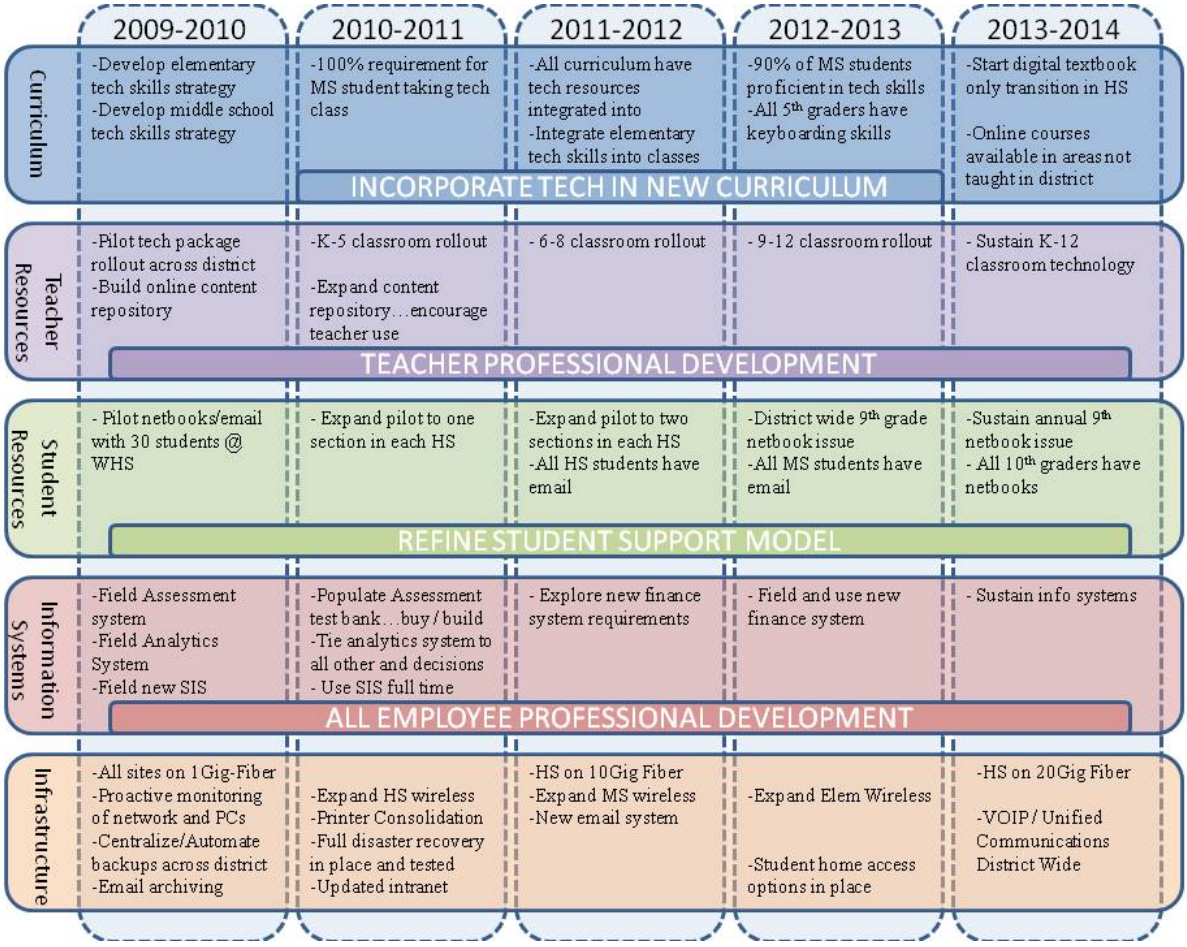
- *Found that students in amplified elementary classrooms showed an average 17 percent increase in their overall on-task behavior. Under amplified conditions, students were found to be less distracted and required fewer repetitions by the teacher.*

There are many other articles and journals that cover classroom technology and proper application as well as the practices related to differentiation, formative assessment, and data analysis. These are important parts of the district's way ahead but are beyond the scope of presentation in this plan.

SUMMARY

This plan provides a vision for the development of all facets of technology in the district over the next five years. This is merely a starting point for departure. This plan will be modified accordingly as we continue to mature our understanding and implementation of technology in conjunction with instructional practice and other developments in the district. The chart below highlights some key goals by year in each of the five focus areas. These goals, when completed, will help us drive towards our five desired end states and thus raise student achievement. By 2014 the SCCSD will have:

- A curriculum that leverages technology in value added ways and teaches technology skills
- All teachers equipped with 21st century teaching tools and have the training to fully use them
- All students outfitted with tools they need to learn in a 21st century instructional environment
- Information systems that are user-friendly and greatly facilitate data driven decision making
- A technology infrastructure that is enterprise class and able to support anything thrown at it



Goal Highlights Over 5 years